Mycoplasmosis in Game Birds

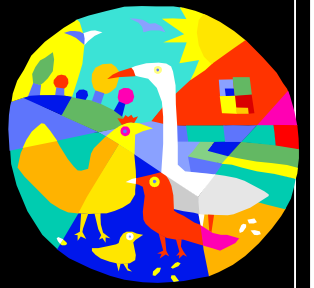
Eva Wallner-Pendleton

Patricia Dunn

Animal Diagnostic Laboratory

Pennsylvania State University

State College, PA



What Are Mycoplasmas?

- Very small bacteria, do not have true cell walls.
- Difficult to grow in most laboratories
- Many different species exist, including some that invade humans, plants, animals, even insects (walking pneumonia in people); generally species specific.
- Bird mycoplasmas do not infect people!!

Mycoplasma: What Do They Look Like??

- Difficult to grow on media
- Colonies look like “fried eggs”

Identification of Mycoplasmas in Birds

- Culture (not available in many labs)
- Antibody (blood tests): Available for MG, MS, MM only
- European research suggests the blood test may not consistently pick up MG antibodies reliably in game birds.
- PCR test (looks for DNA or RNA specific to an organism); best test but not available in most labs.

Many types of mycoplasmas isolated in birds

- Some are pathogens (cause disease), while pathogenicity of some species is unknown.
- Classic pathogenic mycoplasma species:
  - *Mycoplasma gallisepticum* (MG)
    - Infects poultry, game birds, house finches
  - *Mycoplasma synoviae* (MS)
    - Chicken and turkey pathogen
  - *Mycoplasma meleagridis (MM)*
    - *Turkey pathogen*

General characteristics of pathogenic mycoplasmas of domestic poultry

- Delicate organisms, do not survive long outside the host, spread slowly bird to bird.
- Spread by direct bird to bird contact and egg transmission. Spreading of contaminated manure??
- Once infected, a bird remains infected for life. Medications can reduce clinical signs, reduce production loses, reduce egg transmission, but cure on a flock basis not possible

Mycoplasma gallisepticum

- **Pathogen of chickens, turkeys, pheasants, partridges, quail, peafowl, house finches, ostriches, others??**
- **Causes respiratory disease (sinusitis, tracheitis, airsacculitis), infects ovary of the hens, invades the embryo, reduces hatchability, egg production**
- **Transmitted both bird to bird and breeder to chick via the egg.**
- **Surviving chicks perpetuate infection of the flock**

MG Infection: Progression of Disease

-Respiratory disease often seen in flock.

-Asymptomatic carriers also occur!!!!!!!!

-Egg production drop may be observed in breeders.

-Hatchability drops.

-A portion of chicks hatch with the illness, respiratory disease/mortality may be seen.

-Some chicks reach adulthood and produce infected offspring.

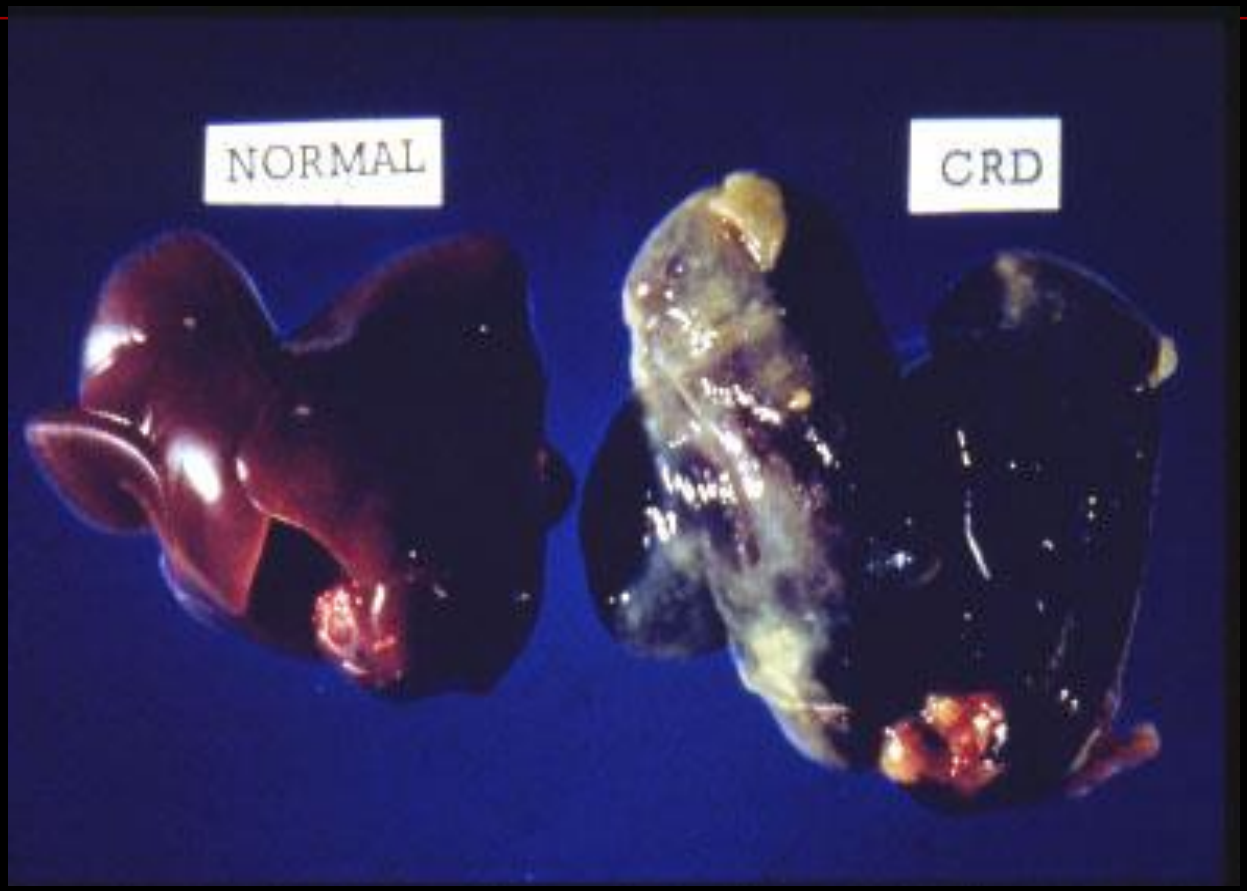
-Stress plays great role in development of clinical disease: social, sexual maturity, temperature extremes, malnutrition, other diseases.

Data from Dr. Kleven's Laboratory, U. of Georgia (survey 1980's to 2007)

- *Mycoplasma gallisepticum* infection in pheasants, chukars, wild turkeys is sporadic in the US. Seen occasionally in quail.
- MG infection more common in Europe.
- Contact with domestic birds?? Backyard chickens, commercial laying chickens are often carriers. Layers often vaccinated with live MG vaccines.
- Surveys in wild turkeys, pheasants, quail show majority are negative for MG.

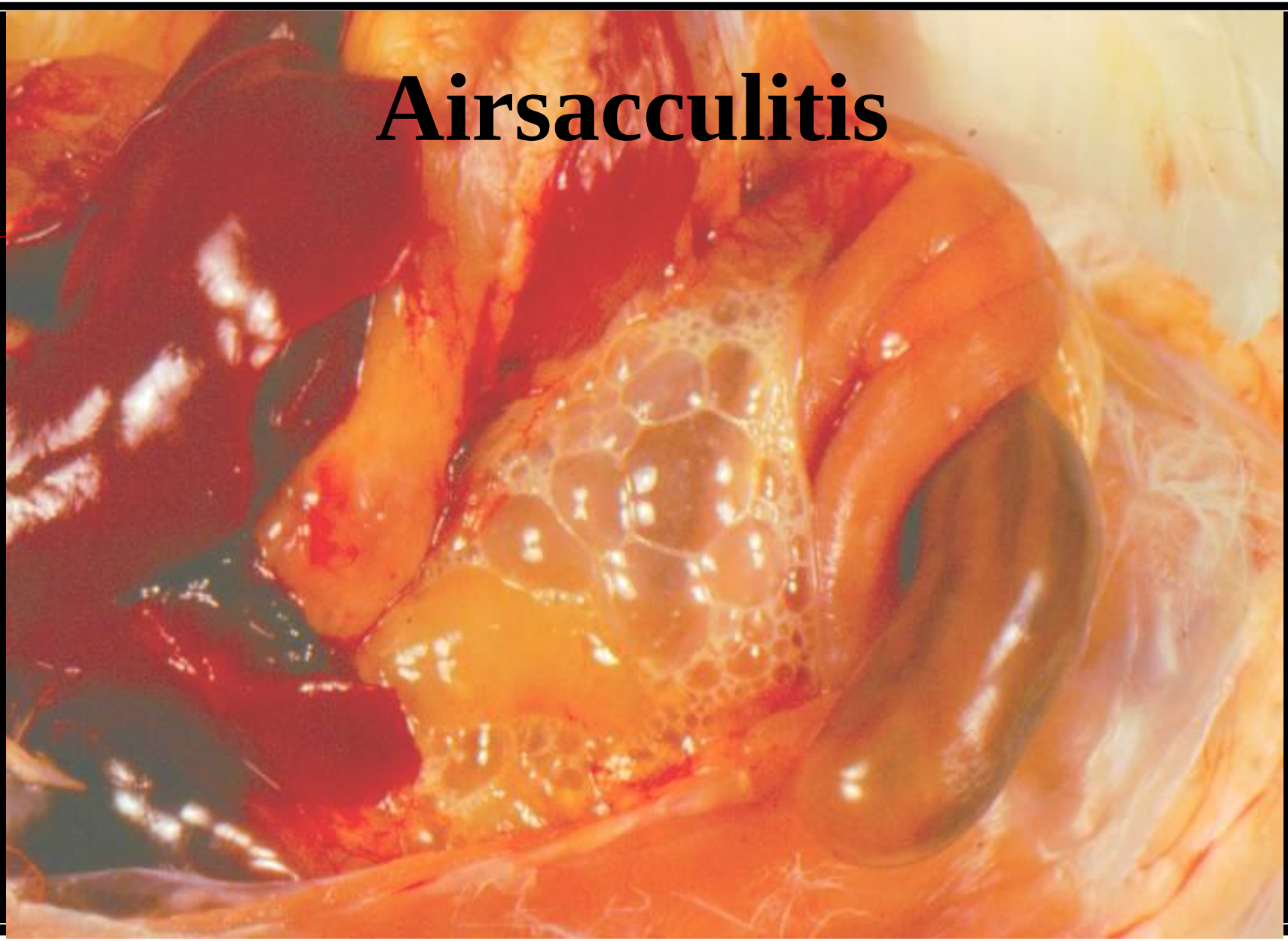
Classic *Mycoplasma gallisepticum* in a wild turkey: Infraorbital sinusitis

Chronic Respiratory Disease (CRD)

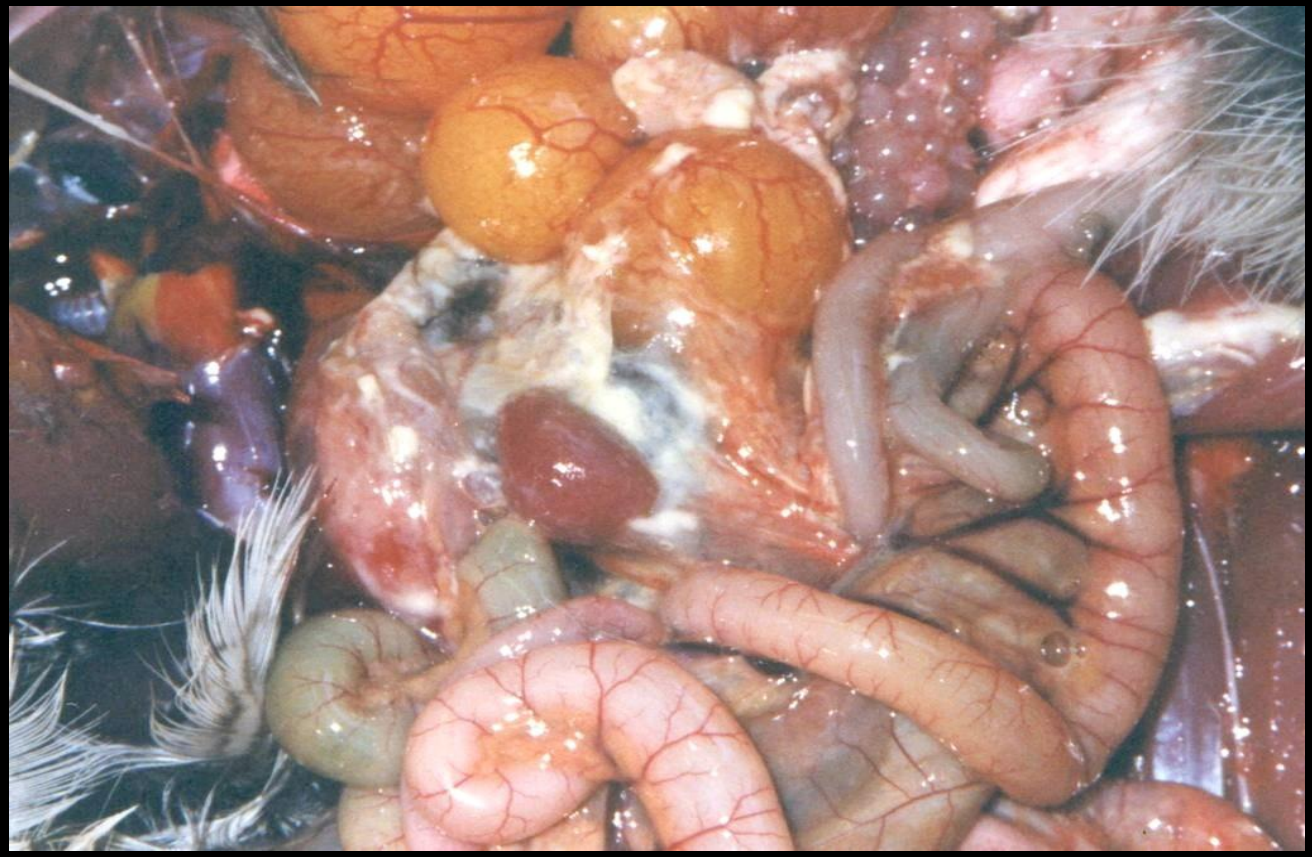


Normal Avian Airsac: Clear like Cellophane

Airsacculitis



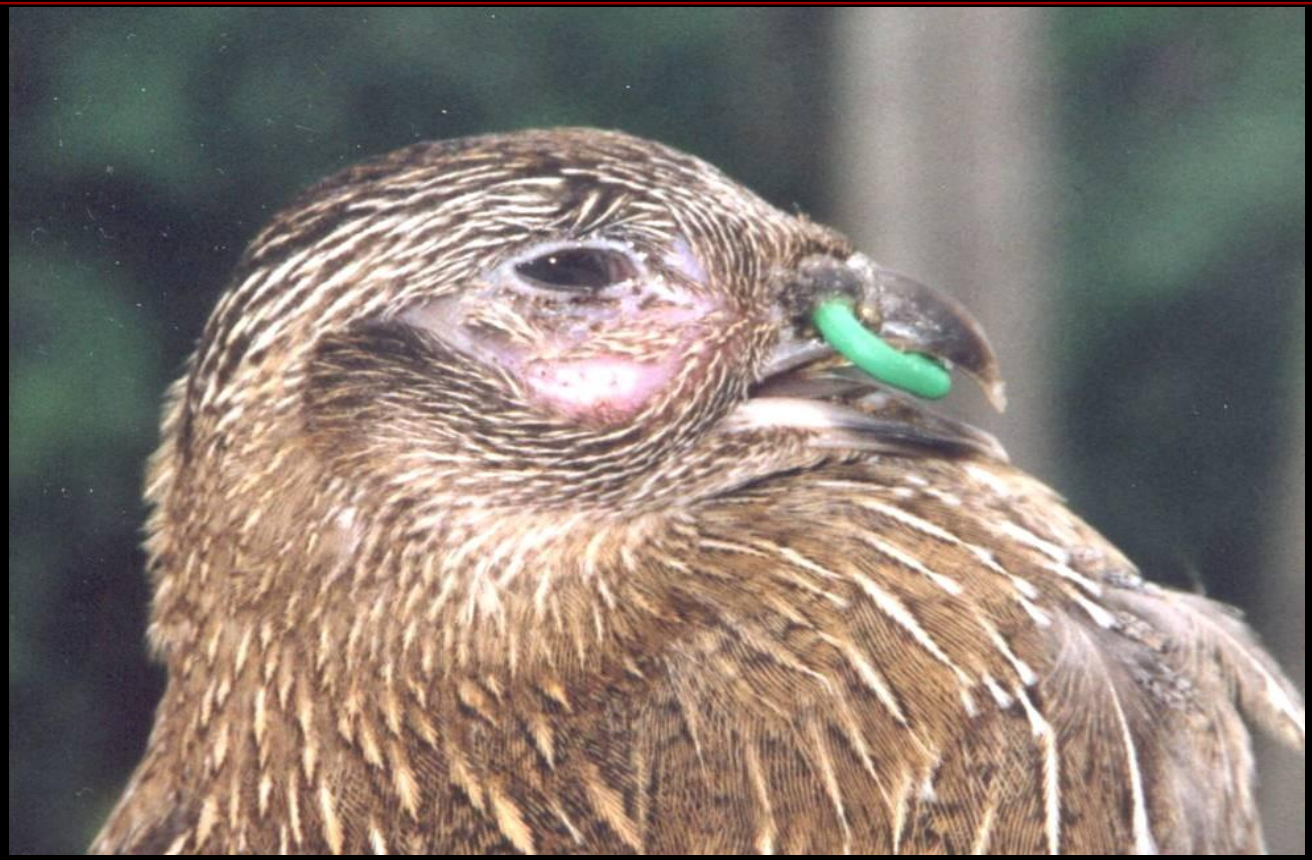
Peritonitis, E. coli often isolated in MG infected birds secondarily.



Typical Field Situations in Game Birds

- Birds develop “snicking, coughing, swollen sinuses.

Similar lesions seen in partridges



Other Avian Mycoplasmas: over 25 species listed under "bird mycoplasmas"

- Role of these as pathogens??
- M. cloacale: duck, goose, turkey, pheasant
  - Observations/clinical studies suggest possible role as pathogen, reports of autogenous vaccination has greatly reduced clinical illness, production losses in pheasants on some premises.

Field Observations

- Outbreaks often seen associated with stress: Sexual maturity, severe weather, etc.
- Many report that this syndrome is responsive to tetracycline in the water or feed.
- Some seen this one year, then maybe not the next.

Results of Testing at ADL Diagnostic Lab last 7 years

- Routine bacterial cultures: Many different organisms isolated from lesions.
- Mycoplasma PCR testing: Almost always positive for mycoplasma, not MG usually
- Serology: Usually negative for MG
- Samples to Dr. Kleven's laboratory:
  - Mycoplasma confirmed, mostly untypable isolates
  - Some identified as M. gallinaceum, M. gallopavonis, others.
  - Challenge study: Needed to see if particular mycoplasma cultured can actually cause disease

Respiratory illnesses in game birds can have MANY causes

- Viruses: Quail bronchitis, paramyxoviruses, Avian Influenza (almost never), Avian pox
- Bacterial infections: E. coli, Avian Cholera, Reimerella anatipestifer.
- Fungus: Aspergillosis
- Parasites: Gape worms
- Recent specking of birds

Sinusitis due to fungal infections

Treatment of these sinusitis/respiratory infection flocks

- Cull out birds with “hard” sinusitis; oral medications rarely cure these animals.
- Get laboratory diagnosis, use a laboratory that has avian pathology expertise.
- Treat according to specific diagnosis.
- If mycoplasma suspected, long term feed and water medication required to control the disease.
- Medication reduces symptoms, does not cure!!
- Disease carriers will remain despite treatment.

Vaccination

- Commercial MG layer vaccines: UK study suggests not effective in game birds.
- M cloacale autogenous vaccine: Observations by an avian veterinarian suggests vaccination was successful in reducing economic effects of a mycoplasma illness on some operations.
- Unknown if mycoplasma situations across the country due to similar or different organisms.
- Egg transmission of non-MG mycoplasma infections in game birds: unknown at this time
- Important area for research.

How to prevent mycoplasmosis in game birds

-Incidence of mycoplasmosis in game birds currently unknown. -We need a better understanding of the disease(s) and pathogenesis.

-Poultry industry experience : eradication can only be accomplished if there are good tests for detection and known free flocks established and maintained.

We are NOT there yet…

Basic Disease Prevention Measures

- Do not bring clinically ill birds onto your farm, especially if your birds have never had this problem (closed flock)
- Mycoplasma PCR testing (MG)???
- Do not allow visitors, trucks, crates on your farm w/o disinfection, protective clothing.
- Request they not have been near other birds at least 24-48 hours prior to visit.

Keep perspective: Mycoplasmosis is serious, but one of many issues facing game birds.

Don’t let diseases catch you unawares!!!

Acknowledgments

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